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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,195	03/02/2004	Kyle K. Kirby	2269-5865US (03-0257.00/U)	1984
24247	7590	06/28/2005	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			NGUYEN, HUNG THANH	
			ART UNIT	PAPER NUMBER
			2841	

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.		Applicant(s)	
	10/791,195		KIRBY ET AL.	
	Examiner		Art Unit	
	HUNG T. NGUYEN		2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 43-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 43-58 is/are rejected.
- 7) ☐ Claim(s) 1 and 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claim 1-20 and 43-58 in the reply filed on 03/02/2004 is acknowledged.

Claim Objections

Regard to claim 1 and claim 43 objected to because of the following informalities: the phrase "orthogonally compliant orientation with the substantially planar substrate" is misdescriptive. Appropriate correction is required. It is suggested that the following language be used in these claims: "orthogonally and compliantly with the substantially planar substrate."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-20 and 43-58 rejected under 35 U.S.C. 102(b) as being anticipated by Benjamin N. Eldridge (US 2001/0020545).

Regard claim 1: Benjamin discloses in figure 10A – 10J a contact pin assembly, comprising: a substantially planar substrate (1008), a first contact pin (a straight portion of 1050 and 1050a as shown in figure 10E) having a contact end on a first side of the substrate (1008) and formed in a place from a first portion of the substrate (1008); and first compliant coupling structure (1026 included 1020 rhodium, 1022 nickel and 1024

gold layer, page 37, paragraph 0636) to couple the first contact pin (a straight portion between 1050a and 1050 as show in figure 10E) in an orthogonally compliant orientation with the substantially planar substrate (1008).

Regard claim 2: Benjamin disclose in figure 5 the contact pin assembly, wherein the first contact pin (explain in claim 1) further comprises conductive material (520 as show in figure 5, page 27, paragraph 0462) around at least a portion of the first contact pin (explain in claim1).

Regard claim 3: Benjamin discloses in figure 5 the contact pin assembly, wherein the first compliant coupling structure (explain in claim 1) is an electrically conductive compliant coupling structure for electrically coupling the conductive material (520) of the first contact pin (explain in claim 1) with the substrate (508).

Regard claim 4: Benjamin discloses in figure 5 the contact pin assembly, wherein the conductive material (520) around the at least a portion of the first contact pin (explain in claim 1) comprises conductive plating for electrically coupling with the first compliant coupling structure (explain in claim 1).

Regard claim 5: Benjamin discloses in figure 10E the contact pin assembly, further comprising a wire bond (502a) extending from the conductive material (520) of the first contact pin (explain in claim 1) to the substrate (1008).

Regard claim 6: Benjamin discloses in figure 5 the contact pin assembly, wherein the first compliant coupling structure (explain in claim 1) is an elastomer material (see figure 5E, page 9 and paragraph 0108).

Regard claim 7: Benjamin discloses in figure 5 – 5I the contact pin assembly, wherein the first contact pin (explain in claim 1) further comprises a first conductor (an end portion of 502a) formed therein from the contact end to an interconnect end of the first contact pin (explain in claim 1).

Regard claim 8: Benjamin discloses in figure 5 – 5I the contact pin assembly, wherein the first contact pin (explain in claim 1) further comprises a conductive block (512 in figure 5) coupled to one of the contact end and the interconnect end of the first conductor (an end portion of 502a).

Regard claim 9: Benjamin discloses in figure 5 – 5I the contact pin assembly, wherein the conductive block (512) is generally rigid (it appears in figure 5 – 5I that conductive block 1024 is generally rigid).

Regard claim 10: Benjamin discloses in figure 5 and 1A the contact pin assembly, wherein the conductive block (1062) is comprised of a compliant material (512 as shown in figure 5 and 112 as shown in figure 1A).

Regard claim 11: Benjamin discloses in figure 5 – 5I the contact pin assembly, further comprising a wire bond (534) from the interconnect end of the first conductor (an end portion of 502a) to the substrate (1008).

Regard claim 12: Benjamin discloses in figure 10D the contact pin assembly, wherein the first compliant coupling structure (1026) is a thinner portion of the substrate coupling an interconnect end of the first contact pin (explain in claim 1) with the substrate (1008).

Regard claim 13: Benjamin discloses in figure 5 the contact pin assembly, wherein the substrate is thinner than a length of the first contact pin (it appears in figure 5 that the substrate is thinner than the length of first contact pin).

Regard claim 14: Benjamin discloses in figure 5 the contact pin assembly, wherein the substrate is a semiconductor wafer (figure 15 shows substrate is semiconductor wafer).

Regard claim 15: Benjamin discloses in figure 5 the contact pin assembly, further comprising at least one stop formed (figure 10A – 10I show at least one stop formed) on the substrate and configured to establish a maximum range of motion of the first contact pin (502a).

Regard claim 16: Benjamin discloses in figure 5 the contact pin assembly, further comprising a conductive bump (502a) on the contact end of the first contact pin (502a).

Regard claim 17: Benjamin discloses in figure 10G the contact pin assembly, wherein the contact end of the first contact pin (502a) further comprises a profile configured to facilitate electrical coupling of the first contact pin (502a) with a contact pad of a device-under-test (1060).

Regard claim 18: Benjamin discloses in figure 17A – 17E the contact pin assembly, further comprising: a second contact pin (1726b) having a contact end on a second side of the substrate (1704) and formed in place from a second portion of the substrate (1704); and second compliant coupling structure (1726) to couple the second contact (1726b) pin in an orthogonally compliant orientation with the substrate (1704).

Regard claim 19: Benjamin discloses in figure 17A – 17E the contact pin assembly, further comprising a conductive trace (1746) configured to electrically couple the first (1742b) and second contact pins (an interconnect end portion with trace 1746).

Regard claim 20: Benjamin discloses in figure 17A – 17E the contact pin assembly, further comprising: an electrically conductive via (1726a and 1726b) extending between the first (1726a) and second sides (1726b); and at least one conductive trace (1726) electrically coupled to the electrically conductive via (1726a and 1726b) and configured to electrically couple together the first (1726a) and second (1726b) contact pins.

Regard claim 43: Benjamin discloses in figure 11A – 11F a contactor card, comprising: a substrate (1008) configured for attachment with a semiconductor tester (it is capable of such an attachment) and at least one contact pin (like claim 1) assembly, including: a substantially planar substrate (like claim 1), a first contact pin (like claim 1) formed in place from a first portion of the substrate; and first compliant coupling structure (like claim 1) to couple the first contact pin (like claim 1) in an orthogonally compliant orientation with the substrate.

Regard claim 44: Benjamin discloses in figure 5 the contactor card, wherein the contact pin further comprises conductive plating (like claim 2) around at least a portion of the first contact pin (like claim 2).

Regard claim 45: Benjamin discloses in figure 5 the contactor card, wherein the first compliant coupling structure (like claim 3) is an electrically conductive compliant coupling structure (like claim 3) for electrically coupling the conductive plating (like claim 3) of the first contact pin (like claim 3) with the substrate (like claim 3).

Regard claim 46: Benjamin discloses figure 5 in figure the contactor card, wherein the substrate (like claim 4) further comprises conductive plating (like claim 4) for electrically coupling with the electrically conductive compliant coupling structure (like claim 4).

Regard claim 47: Benjamin discloses figure 10A – 10I the contactor card, further comprising a wire bond (like claim 5) extending from the conductive plating (like claim 5) of the first contact pin (like claim 5) and the substrate (like claim 5).

Regard claim 48: Benjamin discloses in figure 5 in figure the contactor card, wherein the first compliant coupling structure (like claim 6) is an elastomer material.

Regard claim 49: Benjamin discloses in figure 5 – 5I the contactor card, wherein the first contact pin (like claim 7) further comprises a first conductor (like claim 7) from a contact end to an interconnect end of the first contact pin (like claim 7).

Regard claim 50: Benjamin discloses in figure 5 – 5I the contactor card, wherein the first contact pin (like claim 8) further comprises a conductive block (like claim 8) coupled to one of the contact end (like claim 8) and the interconnect end of the first conductor (like claim 8).

Regard claim 51: Benjamin discloses in figure 5 - 5I in figure he contactor card, wherein the conductive block (like claim 9) is generally rigid (it appears that the conductive block (like claim 9)) is generally rigid.

Regard claim 52: Benjamin discloses in figure 5 and figure 1A he contactor card, wherein the conductive block (like claim 10) is comprised of a compliant material (like claim 10).

Regard claim 53: Benjamin discloses in figure 5- 5I the contactor card, further comprising a wire bond (like claim 11) from the interconnect end of the first conductor (like claim 11) to the substrate (like claim 11).

Regard claim 54: Benjamin discloses in figure 10D the contactor card, wherein the first compliant coupling structure (like claim 12) is a thinned portion of the substrate coupling an interconnect end of the first contact pin (like claim 12) with the substrate (like claim 12).

Regard claim 55: Benjamin discloses in figure 10G the contactor card, wherein a contact end of the first contact pin (like claim 17) further comprises a profile configured to facilitate electrical coupling of the first contact pin (like claim 17) with a contact pad of a device-under-test (like claim 17).

Regard claim 56: Benjamin discloses in figure 17A – 17E the contactor card, wherein the at least one contact pin (like claim 18) assembly further comprises: a second contact pin (like claim 18) having a contact end on a second side of the substrate (like claim 18) and formed in place from a second portion of the substrate (like claim 18); and second compliant coupling structure (like claim 18) to couple the second contact pin (like claim 18) in an orthogonally compliant orientation with the substrate (like claim 18).

Regard claim 57: Benjamin disclose in figure 17A – 17E the contactor card, wherein the at least one contact pin (like claim 19) assembly further comprises a conductive trace (like claim 19) configured to electrically couple the first and second contact pins (652b).

Regard claim 58: Benjamin discloses in figure 17A – 17 E the contactor card wherein the at least one contact pin (like claim 20) assembly further comprises: an electrically conductive via (like claim 20) extending between a first side (like claim 20) and the second side (like claim 20); and at least one conductive trace (like claim 20) electrically coupled to the electrically conductive via (like claim 20) and configured to electrically couple together the first (like claim 20) and second (like claim 20) contact pin.

Benjamin alternatively anticipates claim 1 – 20 and 43 – 58 as follows:

Regard claim 1: Benjamin discloses in figure 11A – 11F a contact pin assembly, comprising: a substantially planar substrate (1104), a first contact pin (a straight portion 1130 and the coating bump as show in figure 11D) having a contact end on a first side of the substrate (1104) and formed in a place from a first portion of the substrate (1104); and first compliant coupling structure (1120 included 1126 gold, 1124 copper and 1122 nickel layer, page 39, paragraph 0655) to couple the first contact pin (a straight portion 1130 and the coating bump as show in figure 11D) in an orthogonally compliant orientation with the substantially planar substrate (1104).

Regard claim 2: Benjamin disclose in figure 5 the contact pin assembly, wherein the first contact pin (explain in claim 1, Benjamin's alternative) further comprises conductive material (520 as show in figure 5, page 27, paragraph 0462) around at least a portion of the first contact pin (explain in claim1, Benjamin's alternative).

Regard claim 3: Benjamin discloses in figure 5 the contact pin assembly, wherein the first compliant coupling structure (explain in claim 1, Benjamin's alternative) is an

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electrically conductive compliant coupling structure for electrically coupling the conductive material (520) of the first contact pin (explain in claim 1, Benjamin's alternative) with the substrate (508).

Regard claim 4: Benjamin discloses in figure 5 the contact pin assembly, wherein the conductive material (520) around the at least a portion of the first contact pin (explain in claim 1, Benjamin's alternative) comprises conductive plating for electrically coupling with the first compliant coupling structure (explain in claim 1, Benjamin's alternative).

Regard claim 5: Benjamin discloses in figure 10E the contact pin assembly, further comprising a wire bond (502a) extending from the conductive material (520) of the first contact pin (explain in claim 1, Benjamin's alternative) to the substrate (1008).

Regard claim 6: Benjamin discloses in figure 5 the contact pin assembly, wherein the first compliant coupling structure (explain in claim 1, Benjamin's alternative) is an elastomer material (see figure 5E, page 9 and paragraph 0108).

Regard claim 7: Benjamin discloses in figure 5 – 5I the contact pin assembly, wherein the first contact pin (explain in claim 1, Benjamin's alternative) further comprises a first conductor (an end portion of 502a) formed therein from the contact end to an interconnect end of the first contact pin (explain in claim 1, Benjamin's alternative).

Regard claim 8: Benjamin discloses in figure 5 – 5I the contact pin assembly, wherein the first contact pin (explain in claim 1, Benjamin's alternative) further comprises a conductive block (512 in figure 5) coupled to one of the contact end and the interconnect end of the first conductor (an end portion of 502a).

Regard claim 9: Benjamin discloses in figure 5 – 5I the contact pin assembly, wherein the conductive block (512) is generally rigid (it appears in figure 5 – 5I that conductive block 1024 is generally rigid).

Regard claim 10: Benjamin discloses in figure 5 and 1A the contact pin assembly, wherein the conductive block (1062) is comprised of a compliant material (512 as shown in figure 5 and 112 as shown in figure 1A).

Regard claim 11: Benjamin discloses in figure 5 – 5I the contact pin assembly, further comprising a wire bond (534) from the interconnect end of the first conductor (an end portion of 502a) to the substrate (1008).

Regard claim 12: Benjamin discloses in figure 10D the contact pin assembly, wherein the first compliant coupling structure (1026) is a thinner portion of the substrate coupling an interconnect end of the first contact pin (explain in claim 1, Benjamin's alternative) with the substrate (1008).

Regard claim 13: Benjamin discloses in figure 5 the contact pin assembly, wherein the substrate is thinner than a length of the first contact pin (it appears in figure 5 that the substrate is thinner than the length of first contact pin).

Regard claim 14: Benjamin discloses in figure 5 the contact pin assembly, wherein the substrate is a semiconductor wafer (figure 15 shows substrate is semiconductor wafer).

Regard claim 15: Benjamin discloses in figure 5 the contact pin assembly, further comprising at least one stop formed (figure 10A – 10I show at least one stop formed) on the substrate and configured to establish a maximum range of motion of the first contact pin (explain in claim 1, Benjamin's alternative).

Regard claim 16: Benjamin discloses in figure 5 the contact pin assembly, further comprising a conductive bump (502a) on the contact end of the first contact pin (explain in claim 1, Benjamin's alternative).

Regard claim 17: Benjamin discloses in figure 10G the contact pin assembly, wherein the contact end of the first contact pin (explain in claim 1, Benjamin's alternative) further comprises a profile configured to facilitate electrical coupling of the first contact pin (explain in claim 1, Benjamin's alternative) with a contact pad of a device-under-test (1060).

Regard claim 18: Benjamin discloses in figure 17A – 17E the contact pin assembly, further comprising: a second contact pin (1726b) having a contact end on a second side of the substrate (1704) and formed in place from a second portion of the substrate (1704); and second compliant coupling structure (1726) to couple the second contact (1726b) pin in an orthogonally compliant orientation with the substrate (1704).

Regard claim 19: Benjamin discloses in figure 17A – 17E the contact pin assembly, further comprising a conductive trace (1746) configured to electrically couple the first (1742b) and second contact pins (an interconnect end portion with trace 1746).

Regard claim 20: Benjamin discloses in figure 17A – 17E the contact pin assembly, further comprising: an electrically conductive via (1726a and 1726b) extending between the first (1726a) and second sides (1726b); and at least one conductive trace (1726) electrically coupled to the electrically conductive via (1726a and 1726b) and configured to electrically couple together the first (1726a) and second (1726b) contact pins.

Regard claim 43: Benjamin discloses in figure 11A – 11F a contactor card, comprising: a substrate (1008) configured for attachment with a semiconductor tester (it is capable of such an attachment) and at least one contact pin (like claim 1, Benjamin's alternative) assembly, including: a substantially planar substrate (like claim 1, Benjamin's alternative), a first contact pin (like claim 1, Benjamin's alternative) formed in place from a first portion of the substrate; and first compliant coupling structure (like claim 1, Benjamin's alternative) to couple the first contact pin (like claim 1, Benjamin's alternative) in an orthogonally compliant orientation with the substrate.

Regard claim 44: Benjamin discloses in figure 5 the contactor card, wherein the contact pin further comprises conductive plating (like claim 2) around at least a portion of the first contact pin (like claim 2).

Regard claim 45: Benjamin discloses in figure 5 the contactor card, wherein the first compliant coupling structure (like claim 3) is an electrically conductive compliant coupling structure (like claim 3) for electrically coupling the conductive plating (like claim 3) of the first contact pin (like claim 3) with the substrate (like claim 3).

Regard claim 46: Benjamin discloses figure 5 in figure the contactor card, wherein the substrate (like claim 4) further comprises conductive plating (like claim 4) for electrically coupling with the electrically conductive compliant coupling structure (like claim 4).

Regard claim 47: Benjamin discloses figure 10A – 10I the contactor card, further comprising a wire bond (like claim 5) extending from the conductive plating (like claim 5) of the first contact pin (like claim 5) and the substrate (like claim 5).

Regard claim 48: Benjamin discloses in figure 5 in figure the contactor card, wherein the first compliant coupling structure (like claim 6) is an elastomer material.

Regard claim 49: Benjamin discloses in figure 5 – 5I the contactor card, wherein the first contact pin (like claim 7) further comprises a first conductor (like claim 7) from a contact end to an interconnect end of the first contact pin (like claim 7).

Regard claim 50: Benjamin discloses in figure 5 – 5I the contactor card, wherein the first contact pin (like claim 8) further comprises a conductive block (like claim 8) coupled to one of the contact end (like claim 8) and the interconnect end of the first conductor (like claim 8).

Regard claim 51: Benjamin discloses in figure 5 - 5I in figure he contactor card, wherein the conductive block (like claim 9) is generally rigid (it appears that the conductive block (like claim 9)) is generally rigid.

Regard claim 52: Benjamin discloses in figure 5 and figure 1A he contactor card, wherein the conductive block (like claim 10) is comprised of a compliant material (like claim 10).

Regard claim 53: Benjamin discloses in figure 5- 5I the contactor card, further comprising a wire bond (like claim 11) from the interconnect end of the first conductor (like claim 11) to the substrate (like claim 11).

Regard claim 54: Benjamin discloses in figure 10D the contactor card, wherein the first compliant coupling structure (like claim 12) is a thinned portion of the substrate coupling an interconnect end of the first contact pin (like claim 12) with the substrate (like claim 12).

Regard claim 55: Benjamin discloses in figure 10G the contactor card, wherein a contact end of the first contact pin (like claim 17) further comprises a profile configured to facilitate electrical coupling of the first contact pin (like claim 17) with a contact pad of a device-under-test (like claim 17).

Regard claim 56: Benjamin discloses in figure 17A – 17E the contactor card, wherein the at least one contact pin (like claim 18) assembly further comprises: a second contact pin (like claim 18) having a contact end on a second side of the substrate (like claim 18) and formed in place from a second portion of the substrate (like claim 18); and second compliant coupling structure (like claim 18) to couple the second contact pin (like claim 18) in an orthogonally compliant orientation with the substrate (like claim 18).

Regard claim 57: Benjamin disclose in figure 17A – 17E the contactor card, wherein the at least one contact pin (like claim 19) assembly further comprises a conductive trace (like claim 19) configured to electrically couple the first and second contact pins (652b).

Regard claim 58: Benjamin discloses in figure 17A – 17 E the contactor card wherein the at least one contact pin (like claim 20) assembly further comprises: an electrically conductive via (like claim 20) extending between a first side (like claim 20) and the second side (like claim 20); and at least one conductive trace (like claim 20) electrically coupled to the electrically conductive via (like claim 20) and configured to electrically couple together the first (like claim 20) and second (like claim 20) contact pin.

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Relevant Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Warren (US20050101037) teaches the compliant pin, Thomas teaches the compliant probe conductive tip (US 20040246010), Igor teaches device under test (DUT) (US 20050017750).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG T. NGUYEN whose telephone number is 571-272-5983. The examiner can normally be reached on 8:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KAMMIE CUNEO can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

HN

Hung Thanh Nguyen

June 20, 2005


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